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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,554	07/07/2003	Elizabeth Ann Dobisz	HSJ9-2003-0007US1	9002

7590 07/27/2005
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EXAMINER

CHEN, TIANJIE

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/615,554

Applicant(s)

DOBISZ ET AL.

Examiner

Tianjie Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Non-Final Rejection

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Gill et al (US 2004/0090718).

Claims 1 and 10, Gill et al shows a hard disk drive including a magnetic head including a read head element in Fig.5, including: a pinned magnetic layer 512 ([0035], line 12); a free magnetic layer 516 having a central portion 536 thereof having a free magnetization; a magnetic bias layer 522 ([0036], line 1), including a central portion 538 thereof that is disposed across the central portion of the free magnetic layer; the central portion of the bias layer being comprised of a material having an approximately zero magnetic moment ([0037], lines 8-13); a barrier layer 540([0043], lines 16-19) being disposed across the central portion of the bias layer.

Claim 19, as described above, Gill et al shows a method for fabricating a magnetic head, including: fabricating a free magnetic layer; fabricating a magnetic bias layer across the free magnetic layer; oxidizing a central portion of the bias layer; depositing an oxygen diffusion barrier layer upon the oxidized central portion of the bias layer.

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Claims 2 and 11, Gill et al further shows that the central portion of the bias layer is comprised of an oxidized material ([0043], lines 16-19), and the barrier layer is comprised of a material Rh or Ru, which is inherently a barrier to oxygen diffusion from the central portion of the bias layer ([0043]).

Claims 3 and 12, Gill et al shows a thin spacer layer 523 that is disposed upon the free magnetic layer 521, wherein the bias layer 522 is disposed upon the thin spacer layer 523 and the barrier layer 540 is deposited upon the bias layer.

Claims 4 and 13, Gill et al further shows that the barrier layer is comprised of a material that has low electrical conductivity.

Claims 5, 14, and 20; Gill et al further shows that the barrier layer 540 is comprised of Ru or Rh ([0043], lines 13-15).

Claims 6, 7, 15, 16, 21, and 22; Gill et al further shows that the barrier layer has a thickness of approximately 20 Å ([0042], lines 31-33)..

Claims 8 and 17, Gill et al further shows that the thin spacer layer is comprised of a material that is a barrier to oxygen diffusion.

Claims 9 and 18, Gill et al further shows that the thin spacer layer is comprised of Ru ([0042], lines 23-24).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 1- 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horng et al (US 2003/0179517) in view of Redon et al (US 6,381,107).

Claims 1 and 10, Horng et al shows a hard disk drive including a magnetic head including a read head element in Fig. 3b, including: a pinned magnetic layer 30 ([0034]); a free magnetic layer 27 having a central portion 10 thereof having a free magnetization; a magnetic bias layer 25, including a central portion thereof that is disposed across the central portion of the free magnetic layer; the central portion of the bias layer being comprised of a material having an approximately zero magnetic moment ([0038] lines 10-14).

Horng et al does not show a barrier layer being disposed across the central portion of the bias layer.

Redon et al shows a magnetic head in Fig. 5 having a barrier layer 75 made of Rh or Ru (Column 5, lines 51-53).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to add the barrier layer 75 into Horng et al's device. The rationale is as follows: Horng teaches a magnetic head with the core portion. It is obvious it has to be sealed for using in a apparatus. Redon et al teaches to add the gap layer 71 and 75 for protecting the core, which is common practice in the art. Redon et al further teaches that the layer 75 can be used for adjusting the distance between the shields (Column 5, lines 53-54). One of ordinary skill I the art would have been motivated to add the barrier layer into Horng et al's device for protecting and adjusting the distance between the shields.

Claim 19, the combination of Horng et al and Redon et al includes a method for fabricating a magnetic head, including: fabricating a free magnetic layer; fabricating a

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magnetic bias layer across the free magnetic layer; oxidizing a central portion of the bias layer; depositing an oxygen diffusion barrier layer upon the oxidized central portion of the bias layer.

Claims 2 and 11, Horng et al further shows that the central portion of the bias layer is comprised of an oxidized material CoFeO ([0038], line 11-13), and the barrier layer is comprised of a material Ru or Rh, which is inherently a barrier to oxygen diffusion from the central portion of the bias layer.

Claims 3 and 12, Horng et al further shows that the magnetic head includes a thin spacer layer 28 that is disposed upon the free magnetic layer, wherein the bias layer is disposed upon the thin spacer layer; in Horng et al and Redon et al's device, the barrier layer is deposited upon the bias layer.

Claims 4 and 13, Redon et al shows that the barrier layer is comprised of a Ru or Rh, which has low electrical conductivity.

Claims 5, 14, and 20; Redon et al shows that the barrier layer is comprised of Ru or Rh.

Claims 6, 15, and 21; Redon et al further shows the barrier layer is comprised of Ru having a thickness of 50 Å (Column 4, line 61-62), which is approximately 40.

Claims 7, 16, and 22; Redon et al shows that the thickness is adjustable (Column 5, lines 53-54). Applicant does not disclose any unexpected result for choosing 20 Å over 50 Å. One of ordinary skill in the art would be able to determine the thickness through experimentation, which would includes the thickness of 20 Å.

Claims 8, 9, 17, and 18; Horng et al shows that the thin spacer layer 28 is comprised of a Ru ([0030]) that is a barrier to oxygen diffusion. thereof that is disposed across the

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Conclusion

3. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is 571-272-7570. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TIANJIE CHEN
PRIMARY EXAMINER